

USE OF ALTEPLASE FOR INTRACARDIAC THROMBUS DURING ASD CLOSURE

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CASE

A 21-year-old female patient, with an indication of ASD OS occlusion due to moderate right chambers enlargement and progressive SOB. The percutaneous procedure was the consensual option of the Heart Team.

The procedure was performed under general anesthesia, accompanied by transoperative transesophageal 3D echocardiography. The access was the right femoral vein. The ASD size was determined with a sizing balloon catheter, and the stop flow diameter was 23.5 mm.

After deflation and removal of the balloon, we observed the presence of extensive thrombus anchored in the upper left pulmonary vein reaching the inferior vena cava, across the interatrial septum.

At that moment, it was verified that the heparinization initially requested, with a dose of 100 IU/Kg had not been performed, being administered immediately. Systemic thrombolysis using alteplase (Actilyse®), with accelerated infusion protocol recommended for acute myocardial infarction (15 mg IV in 2 minutes, followed by 50 mg in 30 minutes and after, 35 mg in 60 minutes). After complete disappearance of the atrial thrombus in 40 minutes, the thrombolytic infusion was discontinued, with a total dose infusion of 90 mg. Activated Coagulation Time (ACT) was 745 seconds. The ASD occlusion procedure was performed using Figulla® ASD 27 Occluder device (Occlutech®) following the standard technique. After the device releasing, the echocardiographic control showed adequate positioning, total occlusion of the defect and absence of residual shunt or intracardiac thrombus.

In post-anesthetic recovery, the patient did not present neurological deficits or any sign of systemic embolization. There was hematoma around the right femoral vein puncture site after removal of the introducer, which was related to the difficulty of hemostasis after thrombolysis. It was maintained with subcutaneous enoxaparin at a dose of 1 mg/kg 2 times a day for 3 days.

On the fourth postoperative day, a new transesophageal echocardiogram was performed, showing a well-positioned prosthesis, absence of pericardial effusion or intracardiac thrombi, and being discharged from the hospital.

LEARNING POINTS OF THE PROCEDURE

The largest studies and series of cases regarding ASD closure procedure show a total complication rate between 7.2% and 8.6% (Spence et al, Heart 2005). The most common complication is embolization or malpositioning of the prosthesis, occurring in 3.5% of cases. The second most frequent complication is the occurrence of arrhythmia in 2.6% of cases. Pericardial effusion, thrombus formation on the

prosthesis disc, dissection of the right iliac vein, and inguinal hematoma are other reported complications.

The presence of thrombi in the left atrium after transcatheter occlusion of interatrial septum defects is a rare but potentially serious complication and can occur with the use of any device, with a frequency varying from 3% to 27% from 30 days after implantation. Pelliccia et al added the transesophageal echocardiogram post-procedure to the usual protocol of completion at 30 days and 6 months, noting that the formation of atrial thrombi is an early complication (4.6% post-procedure vs. 0% in 30 days Or more) and can be treated safely and effectively with immediate systemic thrombolysis.

The presence of thrombi in both atria, and the fact that the thrombi were not related to the presence of the occluder device, but to the presence of the sizing balloon, are the main peculiarities of this case. It should be noted that heparinization was performed late during the procedure. Thus, the importance of systemic heparinization and transesophageal echocardiography during the procedure is clear, and the efficacy of early systemic thrombolysis was observed in the presence of a potentially serious complication with a high thrombotic burden.

Due to the absence of a specific thrombolysis protocol for thrombotic complication during procedure, we decided to use the acute myocardial infarction protocol instead ischemic stroke protocol for being more aggressive using higher doses.

Once in this particular case the thrombotic complication was fixed following that known thrombolysis protocol, allowing to perform successfully the ASD closure without other complications, we suggest to use the acute myocardial infarction thrombolysis protocol for large thrombus complications.